Networking Frictions in Venture Capital, and the Gender Gap in Entrepreneurship

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Abstract

We find that male participants in Harvard Business School's New Venture Competition who were randomly exposed to more venture capital (VC) investors on their panel were substantially more likely to start a VC-backed startup post-graduation, indicating that access to investors impacts fundraising independent of the quality of ideas. However, female participants experience no benefit from exposure to male or female venture capitalists (VCs), which appears related to a reduced propensity to reach out to VCs to whom they were exposed. Our results therefore also demonstrate gender-based differences in the degree to which increased exposure to investors can address networking frictions in venture capital.

I. Introduction

Venture capital (VC) is a crucial financing source for new ideas and technologies (Kaplan and Lerner (2010)). Yet a relatively small number of VC firms and their investing partners account for a disproportionate share of the capital that VCs deploy (Lerner and Nanda (2020)). Frictions in the process through which these gatekeepers learn about new ideas and select a subset for investment can therefore have consequential effects on the types of ideas that are commercialized in the economy. In this article, we study the role of networking frictions in VC-backed entrepreneurship. We define "networking frictions" as deviations from efficient capital allocation that occur when investors acquire information about investment opportunities through their personal networks, to the degree that networks deliver information in systematically imperfect ways.

It is widely known that face-to-face connections and trusted referrals are important, if not primary, deal sourcing methods for many top VC investors.

Two examples from practitioners highlight the role of personal networks. Chris Sacca (Founding Partner of Lowercase Capital), noted that "We are no longer taking blind pitches. Instead, we are going to focus exclusively on deals that come to us through our trusted network of friends and colleagues whom we admire" (Baird (2017)). The U.S. Chamber of Commerce advises firms seeking VC to "reach out to your network to secure an introduction. If that's not an option, you can consider cold outreach but having a personal introduction is the best way to earn an investor's trust quickly" (Johnson (2019)).

VC investors may rely on personal networks because they face extreme information asymmetry with entrepreneurs (Stuart and Sorenson (2005), Hochberg, Ljungqvist, and Lu (2007), and Kerr and Mandorff (2015)). However, heavy reliance on trusted referrals may also privilege those who are better-connected to investors (Baron and Markman (2000), Cohen, Frazzini, and Malloy (2008)). If network-based access to investment opportunities is imperfectly correlated with the quality of ideas, reliance on networks for information could lead to inefficiencies in capital allocation.[1]

Rigorously studying networking frictions is difficult. Social networks are endogenous, making it hard to separate the role of networking frictions from unobserved variables, such as the quality of the idea or whether an entrepreneur's business model is a good fit with VC. Financing frictions are most readily observed via an intervention that alleviates them. For example, an exogenous cash influx can be used to assess whether a firm is financially constrained (Kaplan and Zingales (1997), Rauh (2006), and Howell (2017)). However, exogenously shifting access to networks is typically much harder. We address this empirical challenge by employing exogenous variation in exposure to VC networks at Harvard Business School's (HBS) New Venture Competition (NVC).[2] Like most business plan competitions and accelerator programs, one of the main selling points of the NVC is the opportunity for face-to-face interaction with investors.[3] We examine whether random exposure to VC investors increases the likelihood of VC-backed entrepreneurship among participants after they graduate, and whether male and female founders benefit similarly.

Our interest in differential effects by gender stems from the striking gender gap in high-potential entrepreneurship, and more generally from the lack of diversity among VC-backed entrepreneurs. While women's career trajectories differ from

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[1]While networking is clearly important for building ventures, VC investors themselves can support access to customers and suppliers. It is possible to hire professional management to drive this. At the birth of a firm, however, the entrepreneur is synonymous with the idea, which would suggest that networking frictions at this stage are even more consequential.

[2]The NVC is Harvard's flagship new venture competition and a key gateway to VC-backed entrepreneurship after HBS. Many successful founders, including those of "unicorn" startups such as Rent the Runway and Oscar Health, have been participants in the NVC. Gompers and Wang (2017) note that among business schools, HBS accounts for the largest number of graduates that receive VC funding; the next largest is Stanford GSB, which has half as many alumni who are VC-backed entrepreneurs. HBS, therefore, provides an important and interesting setting to study gender-related frictions in VC-backed entrepreneurship.

[3]Having delivered a pitch to the judges and answered their questions, the participants are in a position to reach out to judges after the competition, leveraging the connection to ultimately raise VC financing for their ventures. The competition does not, however, explicitly encourage such follow-up.

men's across a number of fields (Bertrand, Goldin, and Katz (2010), Goldin, Kerr, Olivetti, and Barth (2017)), the gender gap is especially severe in high-growth entrepreneurship, with women composing only about 10% of VC-backed startup founders (Gompers and Wang (2017), Levine and Rubinstein (2017)). Between 2008 and 2020, the share of annual U.S. VC capital raised by female founders ranged between 1.7% and 2.7%, with no upward trend (https://pitchbook.com/news/articles/the-vc-female-founders-dashboard). A growing literature, including Becker-Blease and Sohl (2007), Scott and Shu (2017), Gornall and Strebulaev (2018), Guzman and Kacperczyk (2019), and Ewens and Townsend (2020) has documented the gap in various ways, but has never directly addressed the potential role of networking frictions. While prior work such as Ewens and Townsend (2020) consider founders who are actively fundraising, our focus is on the pre-fundraising stage. Women comprise only 16% of the entrepreneurs seeking funding in Ewens and Townsend's (2020) data, which is close to their overall share of VC-backed startup founders. As men comprise over 90% of VC investors (Gompers and Wang (2017)), there is a possibility that gender-based homophily in networking could disproportionately impact women's ability to access the personal networks that VCs rely on for deal flow (Gompers, Huang, and Wang (2017), Campero and Kacperczyk (2020)). Our study may help to explain why the gender gap in high-growth entrepreneurship originates early in the startup lifecycle, at or near the moment of founding.

The analysis in this article focuses on the NVC's first round, where each team is assigned to 1 of about 15 panels, each composed of about six judges. We exploit random variation in the number of VC judges across panels, which arises from how judges are allocated to panels. We find that random exposure to an additional VC increases the chances of post-VC entrepreneurship for male entrepreneurs by about 17%. VC judges rarely invest in the startups, and the effect persists when we control for instances when this happens. Instead, the effect occurs through indirect channels, offering compelling evidence for a financing friction stemming from VC reliance on their networks to screen potential investments.

Tests based on placebo effects support this conclusion. There is no effect of VC judges on non-VC-backed entrepreneurship, and no effect on joining a VC-backed startup as an employee. Also, judges on the panel who are male, in the same sector as the participant, or with backgrounds besides VC, such as corporate executives, lawyers, or academics, have no differential effect by gender on VC-backed entrepreneurship (nor do they have an independent effect).

In contrast to the large effect of exposure to VCs on VC-backed entrepreneurship among male participants, this relationship is close to zero among women (see Figure 1). Why might exposure to VCs benefit men so much but not women? There are three possibilities, which are not mutually exclusive: (1) Additional exposure to VCs is not as valuable to women because they are less likely to seek VC financing. (2) Independent of their likelihood to seek VC financing, women are not as proactive in networking with VC investors. (3) Women reach out to VCs after the NVC, but end up benefiting less from the referrals.

We cannot rule out channel (1), but it seems implausible that it fully explains our results, as the women in our data have a demonstrated interest in high-growth entrepreneurship and have identified a particular venture they wish to pursue. While

FIGURE 1

Relation Between VCs on Panel and VC-Backed Entrepreneurship

Figure 1 shows binscatters of the relationship between the number of VCs on the judging panel for a participant, and the probability of VC-backed entrepreneurship for individuals on the venture's team. Graph A restricts the sample to men, and Graph B to women. Here, 0–2 and 6–8 VCs are collapsed into a single category. Together, the figures include all 964 individuals in the HBS NVC.

Graph A. Men   Graph B. Women
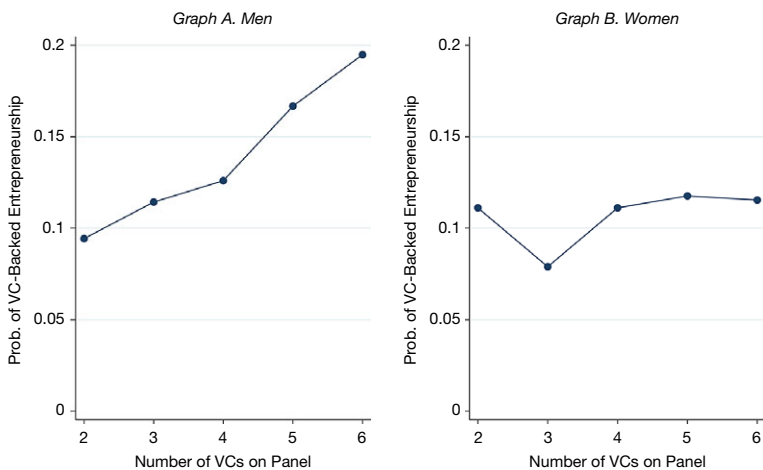
women in our data raise VC funding on average at a lower rate than men (10% vs. 13%), the facts that many do become VC-backed entrepreneurs and random assignment of VCs to panels controls for any average differences across individuals together suggest that it is unlikely that all women exposed to additional VCs were uninterested in ultimately raising VC.

To further probe the channel, we conduct two exercises. First, a survey of NVC participants finds that men are nearly twice as likely as women to proactively reach out to VC investors after the NVC. Qualitative comments in the survey point to a possible explanation, which may more broadly underlie networking frictions: women may be more cautious or hold themselves to a higher standard than men when "selling" their ventures (e.g., only reaching out to VCs when they are ready to fundraise). The phenomenon of women holding themselves to a higher standard has been identified in other settings (Chari and Goldsmith-Pinkham (2017), Kolev, Fuentes-Medel, and Murray (2019)).

The survey results reinforce an implication of our findings: that it is extremely difficult to network with VCs, even for HBS students. While men reported that the NVC was a rare opportunity for networking with VCs (and one that they exploited) women did not, instead voicing a desire for more feedback and interaction but uncertainty about whether it is appropriate to proactively reach out. This led men, on average, to benefit more from exposure to VCs than women.

Second, we show that male investors explain the strong effect of VCs on male VC-backed entrepreneurship. Exposure to female VC judges has no effect among male or female participants. Given that 90% of VC investors are male, this is consistent with gender-based homophily between entrepreneurs and VCs, together

with homophily within investor networks, disproportionately favoring outreach by male entrepreneurs.

We do not find obvious evidence of explicit bias among male VCs against female participants in our sample. In addition to VCs responding to outreach equally by participant gender, we show that the private scores of VC judges are in fact slightly lower for male-led ventures than for women-led ventures. However, less observable bias may be at play or the lack of outreach by women could reflect expectations of discrimination, though observing such expectations is beyond the scope of our article. Together, our results offer the most support for channel (2) and are also suggestive of channel (3), but we cannot rule out a particular channel.

We believe our central contribution is to establish the existence of networking frictions in VC. We show that exposure to VC investors (which is unrelated to the quality of the ideas) can substantially increase the chance of VC-backed entrepreneurship for some entrepreneurs. This means that network-based access rather than only the quality of the idea plays a role in a startup's ability to raise VC. In addition, we document how a structural intervention that creates opportunities for exposure to investors does not benefit all entrepreneurs equally and may not be sufficient to overcome the large barriers that women face in the networking process.

We contribute to work in financial economics on the importance of personal networks for resource allocation. For example, Goyal, Wahal, and Yavuz (2020) show that pension funds allocate mandates to investment managers with whom they have a personal connection. Hochberg, Ljungqvist, and Lu (2007) show how networks matter in the VC setting. While this and other work focuses on syndication networks among VCs, our article documents how these networks are a valuable potential source of deal flow for VCs, even when there is no explicit syndication between investors. Our findings also shed light on an important potential driver of the gender gap in entrepreneurship, even among highly ambitious, well-positioned female entrepreneurs. Of course, there are other drivers of the gender gap that our empirical strategy controls for but does not assess, such as different family obligations, industry interests, and risk preferences (Barber and Odean (2001), Niederle and Vesterlund (2007), Sapienza, Zingales, and Maestripieri (2009), Bertrand et al. (2010), Bertrand (2013), Pew (2015), Bertrand, Kamenica, and Pan (2015), Fang and Huang (2017), Goldin et al. (2017), and Guzman and Kacperczyk (2019)). Our goal is not to address these potentially profound, population-wide explanations. Instead, we focus on evaluating networking-related frictions to accessing VC among individuals demonstrating serious interest in high-growth entrepreneurship.

We offer evidence that networking affects capital allocation and that women benefit less from an intervention in which they were randomly exposed to VCs. From an economic perspective, these results suggest that systematic gender-related frictions can lead high-quality entrepreneurs or ideas to go unfunded. They also have immediate implications for NVCs and accelerators, which often emphasize networking opportunities with investors, and which are now an important part of the entrepreneurial ecosystem (Howell (2020)). Exposing entrepreneurs to networking opportunities and assuming that people will contact each other may not be enough. Programs might consider encouraging and formalizing networking opportunities or VC access to information about participating ventures.

II.   Data

This section first describes the HBS NVC. We discuss HBS administrative and career history data in Sections II.B and II.C. Section II.D explains the survey design.

A.   HBS NVC Data

The NVC is a startup "pitch" competition in which founders present their business ideas to expert judges. The NVC promotes itself as an opportunity for students to "put entrepreneurship principles into practice," to receive feedback on their ideas, and to get exposure to key stakeholders in the entrepreneurial ecosystem. There is also a cash prize for the ultimate winner and runners up in the competition. This type of business plan competition is now a standard component of many undergraduate and MBA programs, and is also a common stepping stone in an early stage startup's life, particularly for first-time founders and student entrepreneurs (Howell (2020)).

The NVC started in 1997 with a business track. It added a social enterprise track in 2001 and an alumni track in 2010. The core data set for our analysis consists of comprehensive team and judging information for the business track between 2000 and 2015 (except for 2003, for which no data are available).[4] The competition has three rounds, but our analysis focuses on the first round, in which teams and judges are assigned to parallel sessions that run roughly simultaneously in separate rooms.[5] Judges formally score the pitches of participating ventures, and these scores determine which ventures proceed to the next round of judging. Each team's pitch and question period lasts only about 15 min, but there are opportunities for follow-up by a proactive student or judge. This follow-up could occur at the cocktail hour after the pitch sessions, or privately if the student or judge requests contact information directly or from HBS NVC administrators.

Several elements make the NVC's first round an attractive setting to explore the role of gender-related networking frictions in early stage, high-growth entrepreneurship. First, participants not only demonstrate a revealed preference for joining the labor force (by virtue of attending business school), but also demonstrate an interest in pursuing high-growth entrepreneurial activity. Startups founded by HBS alumni have gone on to raise substantial amounts of VC. For example, one analysis of Pitchbook data found that "1,069 HBS MBAs have founded 961 companies that have raised $22.4 billion in VC [..] Entrepreneurs from HBS have

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[4]We do not consider participants in the social enterprise track for this analysis because of the potential mismatch between the goals and business models of such ventures and the objectives of for-profit venture capital investors. The alumni tracks are run by local alumni chapters, making the data inconsistent and hard to gather.

[5]The value of the cash prize and the number of runner-up teams getting a prize has changed over time, but the structure of the judging (which forms the basis of our empirical strategy) has not changed during the period we study. Specifically, in 1997, the winning team at the business plan competition was awarded $10,000 and three runner-up teams were each awarded $5,000. In 2009, the winning team's award was changed to $25,000 and two runner-up teams shared $10,000 each. In 2013, the winning team received $50,000 and one runner-up team was awarded $25,000. The cash prize for the winning team was raised to $75,000 in 2017, but this change was outside of our sample period. Also, the competition was re-branded from the HBS "Business Plan Competition" to the HBS "New Venture Competition" in 2013.

founded 13 unicorns (nearly double its closest competitor, Stanford)."[6] Among U.S. business schools that focus on entrepreneurship, HBS has among the largest student bodies and thus offers a substantial sample for study, even when the sample is restricted to NVC participants.[7]

Second, as we elaborate below, our research design assesses how conditionally random variation in the number of VC judges across panels impacts VC-backed entrepreneurship after HBS. This enables us to overcome the challenge that exposure to VCs is typically nonrandom and unobserved, making it hard to study networking frictions in VC-backed entrepreneurship. Beyond the research design, we observe individual and venture characteristics that, while not needed for identification, provide reassurance about the mechanism we document in our analysis. Of particular note is our access to the scores that judges assign to team. These data are private, so participants never observe their own or other teams' scores. Judges score independently and observe only their own scores, and never a venture's overall rank. The private scores enable us to control for a measure of venture quality when conducting our analysis.

To participate in the NVC, a founding team must have at least one member who is a current HBS MBA student. About 70% of participants are HBS students; other participants are mostly students elsewhere at Harvard, and a minority are students at other universities or recent graduates. We restrict our sample to the 964 unique participants who are HBS students at the time of the competition, because we have a rich set of covariates about them that are typically unobserved, as well as comprehensive outcome data post-graduation. As Panel A of Table 1 shows, 32% of the participants are female, which is only slightly smaller than their share of the overall HBS population.[8] The participants are members of 647 teams, each of which has 2.5 members on average. Panel B of Table 1 shows that average team sizes for female and male participants are quite similar. Across all years in our data, there are 573 unique judges, of which 243 are VCs. Some judges participate in multiple years. Each panel has on average six judges, as shown in Panel D of Table 1. Just over half of judges on a panel are VCs on average, though this can and does vary substantially due to the way in which judges are assigned to panels.

B. HBS Administrative Data

Working with the staff at the HBS MBA program and alumni office, we were able to create an anonymized but individual level data set that includes information on student backgrounds and interests while they were at HBS. Specifically, we matched each of the 964 students in our sample to administrative data from HBS on the candidate's gender, an indicator for being a U.S. citizen, and indicators for

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[6]Examples of these "unicorns" include health insurance company Oscar, fashion rental company Rent the Runway, and video game producer Zynga (see https://www.businessbecause.com/news/mba-entrepreneurs/4183/harvard-startups-rake-in-venture-capital).

[7]In 2017, U.S. News ranked HBS the third best MBA program for entrepreneurship, and it has more than double the annual enrollment of any other program in the top five (see https://www.usnews.com/best-graduate-schools/top-business-schools/entrepreneurship-rankings).

[8]The 36% of HBS graduates who are women is slightly less than the 43% in 2006 across all MBA programs, but higher than the 26% of Chicago Booth MBAs between 1990 and 2006 that were women (Bertrand et al. (2010)).

TABLE 1

Characteristics of Participants

Panels A–C of Table 1 contain statistics on the 964 HBS participants in the HBS NVC from 2000 to 2015. Team size is a venture-level variable, but is summarized at the individual level. Team size including non-HBS participants reflects additional individuals who are not included in estimation. Indicators for professional background (e.g., finance employment) reflect whether the individual had any instance of that experience; participants may have had multiple jobs before HBS. *P*-value is 2-tailed. Panel D contains statistics on the 964 HBS participants in the HBS NVC from 2000 to 2015. The unit of observation is the individual participant, but the first six variables are at the panel level (in the first round of the competition, which is the focus of our study, ventures pitch and are scored within panels). We observe a total of 180 panels across all years. As an example of interpretation, the first two rows indicate that female participants are assigned to panels that have on average 5.93 judges, of which 3.21 are venture capitalists (VCs). The last three variables are at the team (i.e., venture) level, though again the unit of observation is the individual. For example, female participants' teams average score is 3.39, and they have a 0.21 chance of winning the first round. *P*-value is 2-tailed.

Panel A. Count of Individuals

	All	Female	Male	Fraction Female
No. of individuals	964	307	657	0.32

	All	Female	Male	*p*-Value (Male – Female)
Panel B. Team Size (means)				
Mean team size including non-HBS participants	2.53	2.55	2.52	0.56
Mean team size, HBS participants only	1.79	1.83	1.77	0.24
Panel C. Professional Background Before HBS (means)				
Entrepreneurship	0.26	0.23	0.27	0.17
VC-backed company employment	0.45	0.48	0.44	0.17
VC firm employment	0.04	0.04	0.04	0.85
Finance employment	0.27	0.32	0.25	0.01
Consulting employment	0.29	0.31	0.28	0.34
Panel D. Panel Composition and NVC Outcomes (means)				
Total no. of judges on panel	6.00	5.93	6.01	0.47
No. of VC judges on panel	3.29	3.21	3.33	0.28
No. of male VC judges on panel	2.78	2.71	2.81	0.32
No. of judges in own sector on panel	2.44	2.33	2.49	0.17
Match to judges in own sector on panel	0.80	0.84	0.79	0.09
Match to VC judges in own sector on panel	0.72	0.74	0.71	0.27
No. of entrepreneur judges on panel	0.85	0.87	0.84	0.61
No. of corporate executive judges on panel	0.97	0.93	0.99	0.32
No. of ventures on the panel	4.82	4.80	4.83	0.69
Score in panel (1 worst, 5 best)	3.27	3.39	3.22	0.01
Score in panel if 10–90th percentile (1 worst, 5 best)	3.30	3.37	3.27	0.11
First round winner	0.20	0.21	0.19	0.40
Finals winner or runner-up	0.07	0.09	0.07	0.25

having an undergraduate degree in computer science, engineering, and economics, business or management. Additional controls include attending an undergraduate university that was in the Ivy League or was MIT, Stanford or Caltech, having founded or co-founded a company prior to HBS, having worked at a VC-backed startup prior to HBS and having worked at a VC firm prior to HBS. We also include indicators for the student having self-identified as having a personal or professional interest in entrepreneurship, or being involved in entrepreneurship or VC clubs at HBS. We describe the most relevant variables in Table 1 and omit the remainder for parsimony.

As we explain below, our empirical design exploits random variation in the number of VCs across panels. Nevertheless, the rich set of individual characteristics are valuable as they help us further control for any differences in interests, skills, and experience related to VC-backed entrepreneurship that may be correlated with the participant's gender, factors that are typically unobserved in most studies

examining the gender gap in entrepreneurship. This allows us to verify the validity of our identification assumption, as our estimates remain quite stable with the inclusion of these additional covariates.

C. Career Histories

We supplement the HBS administrative data with an anonymized but individual-level panel data set of career histories for each NVC participant, based on collaboration with staff at the HBS alumni office. Our data include the names of the organizations at which they worked, their titles at each organization, and the years associated with each position. We use the titles to define whether an individual was a founder or co-founder of a business, and we determine if the startup received VC by looking for a match to the firm's name and location in two sources of data on VC deals: CB Insights and VentureXpert. By combining these pieces of information, we are able to create three sets of indicator variables: (1) VC-backed entrepreneurs, if they were a co-founder of a firm that matched to the database of companies with VC investment; (2) Non-VC backed entrepreneurs, if they were a co-founder of a firm that did not match to this database; and (3) Employed at VC-backed firm, if they were employed at but not a co-founder of a firm that did match to this database.

Table 2 shows entrepreneurship outcomes after HBS. As can be seen from these descriptive statistics, the probability that an NVC participant starts a VC-backed firm, at 12%, is large. In the overall U.S. population, about 0.3% of people start a new business in any given year (see https://indicators.kauffman.org/). And among all new U.S. firms, just 0.11% are VC-backed (Puri and Zarutskie (2012)). Moreover, while there is a difference in the probability of male participants becoming VC-backed entrepreneurs relative to female participants in our data, it is small

TABLE 2

Participant Entrepreneurship Outcomes After HBS

Table 2 reports descriptive statistics on HBS participants in the HBS NVC from 2000 to 2015. The number of observations is 964 (all participants) in Panel A. Panel B restricts the sample to the 114 ventures with VC funding founded by participants. Further, funding statistics are limited to the 73 ventures for which we have funding data. Note that indicators for professional outcomes (e.g., VC-backed startup employment) reflect whether the individual had any instance of the outcome; participants may have multiple jobs post-HBS. P-value is 2-tailed.

Panel A. Individual Entrepreneurship-Related Outcomes (means)

	All	Female	Male	p-Value (Male – Female)
VC-backed entrepreneurship	0.12	0.10	0.13	0.36
Non-VC-backed entrepreneurship	0.20	0.17	0.21	0.23
VC-backed startup employment	0.48	0.52	0.46	0.07

Panel B. Venture Outcomes Conditional on VC-Backed Entrepreneurship

	All		Female		Male		p-Value (Male – Female)
	N	Mean	N	Mean	N	Mean	
Judge or judge's firm invested	114	0.02	32	0.00	82	0.02	0.38
Funding within 2 years of NVC (mill $)	73	45	21	37	52	48	0.84
>10 employees as of Mar., 2018	114	0.64	32	0.69	82	0.62	0.52
Venture acquired	114	0.22	32	0.16	82	0.24	0.31

relative to the differences documented in the broader population of U.S. startups (e.g., Gompers and Wang (2017)).

These differences between our sample and the broader population are to be expected. First, participants in the HBS NVC are much more likely to become VC-backed entrepreneurs than the population of potential entrepreneurs. Businesses founded by elite business school graduates are much more likely to be amenable to and attract VC financing than the average business started in the broader population. Second, relative to the average female entrepreneur, the sample of female participants at HBS in general, and those participating in the NVC in particular, appear to have several differentiating characteristics. They are more likely to participate in the labor force following graduation and more likely to start new ventures in industries that tend to receive VC. Participation in the NVC reveals an interest in high-growth entrepreneurship, which places these women in a very selected category relative to the average woman or even the average female entrepreneur.

These factors are likely to narrow the gap between the post-HBS VC-backed entrepreneurship rates across male and female participants relative to the broader population. Of course, they also mean that our results may be less externally valid. However, we believe that the elite and entrepreneurial nature of women in our sample should push against finding an effect of exposure to networking opportunities. That is, this group of women seems especially well positioned to network effectively with VCs.

Panel B of Table 2 shows that conditional on raising VC, the companies that women in our sample build are not lower quality than those that men build. Furthermore, NVC judges score women higher than men (Panel D of Table 1). This could reflect selection into the NVC; for example, it may be that because of additional challenges to high-growth entrepreneurship that women face, only extremely high-quality women select into the NVC. This is consistent with the above point, which is that selection into the NVC should favor individuals who proactively network.

D.   Survey Data

As part of an effort to help the administrators of the NVC consider ways to facilitate more interaction between participants and investors, we obtained access to survey data on the networking experiences of NVC participants. The survey asked all NVC participants who were HBS alumni 4 yes/no questions:

1. "After the NVC did you reach out to any judges on your panel who were VC or angel investors?"
2. "If yes, did any respond?"
3. "After the NVC did any judges on your panel who were VC or angel investors reach out to you?"
4. "If yes, did you respond?"

The following open-ended question was also included: "Optional: Please let us know any thoughts you have about the importance and ease of networking with startup investors at the NVC."

In Section III, we use the survey responses to provide suggestive evidence about the mechanism behind our results.

III.   Research Design

Our empirical strategy focuses on the first round of the NVC, where teams and judges are assigned to panels. NVC administrators invite individuals with a range of occupational backgrounds to judge, including investors, entrepreneurs, corporate executives, and lawyers working with startups. The large number of elite VCs who participate offer a rare opportunity for in-person interaction with such investors. Recent academic work highlights the importance of in-person interaction in startup investment decisions, including Huang, Ivković, Jiang, and Wang (2023) and Hu and Ma (2020).

To facilitate allocating judges to panels, NVC administrators ask judges to fill out a self-assessment of their expertise across a number of industry sectors. This assessment is absolute rather than relative, so that a judge can claim to be an expert in more than one sector. A few days before the competition, once the pools of entrepreneurs who will be presenting their business plans and judges who are available have been established, an effort is made to assign entrepreneurs to panels with judges who claim to have expertise in their respective sectors. Administrators aim to have between five and seven judges per panel as they rightly anticipate some attrition of judges on the day of the competition. This size requirement means that some judges who are assigned to a panel may not have expertise in the sector comprising most of the ventures on the panel.[9] Importantly for our analysis, judge occupations are not used to allocate judges to panels and are not even explicitly recorded by administrators. The program design therefore yields variation in the number of VCs across panels.

For our identification strategy to be valid, it must be the case that variation in the number of VCs across panels is orthogonal to characteristics of ventures that may differ along gender lines. In this regard, our identification strategy maps closely to Lerner and Malmendier (2013), who rely on random variation in the prior entrepreneurial background of HBS students assigned to different classrooms, where assignment is determined by stratification on other observable characteristics, including education, ethnicity, gender, and country of origin. Both their setting and ours lack pure random assignment, but the key variable of interest is not used in the assignment rule. Moreover, since the NVC administrators have shared that their assignment is based only on sector expertise, which we can observe and explicitly control for, our identification is closer to conditional random assignment as

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[9]Consistent with a desire to match ventures to judges with related expertise, we observe that at the sector level, there is a correlation between company and judge expertise. For example, startups in the IT/Software/Web category have on average 2.97 judges with related expertise, while non-IT startups have on average 2.25 judges with IT expertise on their panel, a difference that is significant. Matching appears strongest in health care. The only sector without such a significant correlation is Media/Education, though as Table A.1 in the Supplementary Material shows, this is a small sample with just 66 participants in this sector.

described in Krueger (1999), Duflo, Glennerster, and Kremer (2007), and Angrist and Pischke (2008).[10]

We next demonstrate the validity of our empirical design. One way in which matching along industry lines would lead to systematic variation in the number of VCs is if there were systematic differences in self-assessed sector expertise across occupations, which caused systematic differences in the number of VCs on panels by sector. Note that under conditional random assignment, controlling for gender by sector fixed effects obviates this concern (see Duflo et al. (2007)). Below, we demonstrate that the results are robust to including these controls. However, to further confirm that this is not an issue, we show in Figure A.1 in the Supplementary Material that the average number of VC judges on each panel is similar across venture sectors, and importantly there is wide variation in the number of VCs on the panel among participants in a given sector. Summary statistics about the sector composition of judges and participants are in Table A.1 in the Supplementary Material.

Having shown that there is no systematic variation in the number of VCs across panels by sector, we turn next to gender-specific statistics. Panel D of Table 1 shows that there is no difference in the number of ventures per panel across male and female participants, nor is there systematic variation in the number of VCs or the number of sector experts that men and women are exposed to. We further show in Figure A.1 in the Supplementary Material that sectors with relatively more male VC-backed entrepreneurs do not also have relatively more VCs on the panel. Finally, Table A.2 in the Supplementary Material shows by sector that men are not more likely to have more VC judges in their own sector. Together with the fact that the NVC administrators do not pay explicit attention to the occupation of judges, the results from these tests show that the program design enables us to identify the effect of participant exposure to more relative to fewer VCs.

An important control variable that we observe is comprehensive judging data, including each judge's numeric score of the ventures on their panel. These scores are not observed by participants, and judges know only their own score. Program administrators average them and then force-rank the ventures within a panel, which determines which ventures will proceed to the next round. Figure A.2 in the Supplementary Material uses a binscatter to show that score is correlated with subsequent VC-backed entrepreneurship. The red line provides the linear fitted values, which is the same as the coefficient on a regression of the *y*-values on the *x*-values. The upward slope is highly significant (confirmed in columns 1 and 2 of Table A.3 in the Supplementary Material), indicating that score is a useful control for the latent quality of the venture.

Panel D of Table 1 shows that female participants' teams have an average score of 3.39, where 1 is the lowest possible score and 5 is the highest. Male participants' average is a bit lower, at 3.22 (statistically different at the 0.05 level). Female

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[10]The reason we do not assert that our identification is identical to these articles is because sectors varied slightly from year to year, so that sector fixed effects do not in all cases control explicitly for the specific expertise stated by the judge. For example, in some years but not others a "Defense/Security" category was included, but we have folded this into "Tough Tech." Our results are robust to restricting the sample to sectors that were consistent across years.

participants have a 21% chance of proceeding to the semifinals, compared to a 19% chance for male participants, though this difference is not statistically significant. Women also have a higher chance of ultimately winning the competition in the final round. Their chance of being a finalist or runner-up is 9%, compared to 7% for men (though again the difference is not significant). We do not use semifinals or finals data because the number of participants is far fewer, there is only one panel in each of those rounds, and there is inadequate variation in the number of VC judges. Our vector of competition covariates consists of the venture score in the panel, an indicator for winning the round (semifinals participation), an indicator for winning the competition (overall or runner-up), the number of ventures on the panel, the number of male judges on the panel, and the number of total judges on the panel.

IV.   Results

This section first presents the main results, both visually and using regression models (Section IV.A). Robustness tests are discussed in Section IV.B.

A.   Main Results

Before showing regression evidence, we begin by presenting raw averages. Table 1 reports summary statistics for the 964 participants across 180 panels in the HBS NVC from 2000 to 2015. It documents that on average, women participate in teams that are no different in size than men (2.55 vs. 2.52, as seen in Panel B), that women have similar professional backgrounds to men in terms of entrepreneurship, and employment in VC-backed firms (as seen in the first two rows of Panel C). In Panel D of Table 1, the unit of observation is the individual participant, but the first six variables are at the panel level. For example, the first two rows indicate that female participants are assigned to panels that have on average 5.93 judges, of which 3.21 are venture capitalists (VCs). Importantly, the number of VCs and male VCs are not different across panels where men and women pitch.

Table 2 reports the likelihood of VC-backed entrepreneurship as well as the outcomes conditional on VC-backed entrepreneurship. Table 3 shows the share of participants who subsequently become VC-backed entrepreneurs by gender and

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TABLE 3

Characteristics of NVC Judging Panels by Number of VC Judges on Panel

Table 3 reports descriptive statistics at the panel level, for the 180 judging panels in the HBS NVC from 2000 to 2015. We separately consider panels by the number of VCs. There are 62 panels with ≤ 2 VCs, 81 panels with 3–4 VCs, and 37 panels with at least 5 VCs.

	≤ 2 VCs	3–4 VCs	≥ 5 VCs
Panel A. Number of Judges and Participants (means)			
No. of judges on panel	5.8	5.9	6.5
No. of ventures in panel	3.6	3.6	3.6
No. of participants	5.2	5.4	5.5
Panel B. Share of Panel Participants with Post-HBS VC-Backed Entrepreneurship			
Share of males	0.09	0.12	0.18
Share of females	0.11	0.09	0.12

the panel's number of VC judges. For women, the rate of VC-backed entrepreneurship exhibits no relationship to the number of VC judges. However, for men, there is a strong association. Men have a 9% chance of becoming VC-backed entrepreneurs with two or fewer VCs on the panel, a 12% chance with three to four VCs, and an 18% chance with five or more VCs on the panel. This relationship is demonstrated graphically in Figure 1 using binscatters, in which each number of VCs on the panel is a bin. The dots indicate the average chance that an individual in the bin founds a VC-backed startup (i.e., it is the mean of all observations in the bin). Graph A shows that venture backing is monotonically increasing in the number of VCs on the panel among men. In striking contrast, Graph B shows that there is a much weaker relationship for women, if any.

Table 4 shows the same result as the figure but in OLS regression form and has three important insights. First, the results suggest an important potential networking friction in VC. When the sample is restricted to male entrepreneurs, we observe that random exposure to an additional VC on the NVC panel increases the chances of post-VC entrepreneurship for male entrepreneurs by about 17% (column 3). This shows that access to investors appears to privilege those whose networks give them better access to investors, independent of the quality of their ideas. The relatively large magnitude of the effect among men is consistent with anecdotal accounts we have heard from HBS students that it is not trivial for them to get access to VCs' time. An analogy is to an academic who, even at a top department, may not easily be able to get her work in front of seniors in her field. It is very helpful to attend a conference with the seniors, where she will have specific topics to discuss and opportunities to make personal connections. Similarly, the pitch-specific, in-person discussion at the NVC appears to offer particularly valuable connections with VC investors.

The second insight from Table 4 is that while exposure to more VCs benefits men, this does not appear to be symmetric by gender. Women do not benefit from additional exposure to VCs the way that men do (columns 5 and 6). The third finding is that the inclusion of a large number of controls and fixed effects do not

TABLE 4

Effect of Number of VC Judges on VC-backed Entrepreneurship

Table 4 shows the effect of the number of venture capitalists (VCs) on the probability that participants in the HBS NVC subsequently found VC-backed ventures. "VCs_ON_PANEL" is the continuous number of VC judges on the panel. See text for list of control variables. Standard errors are clustered by judging group (the "panel" of ventures who pitch to a certain set of judges). *, **, and *** indicate significance at the 10%, 5%, and 1% levels, respectively.

	Dependent Variable = VC-Backed Entrepreneurship After HBS					
Independent Variables	Whole Sample		Men Only		Women Only	
VCs_ON_PANEL$_1$	0.015*	0.012	0.022**	0.023**	−0.001	−0.013
	(0.008)	(0.009)	(0.010)	(0.011)	(0.012)	(0.013)
Year FE	No	Yes	No	Yes	No	Yes
Sector FE	No	Yes	No	Yes	No	Yes
Competition controls	No	Yes	No	Yes	No	Yes
Person controls	No	Yes	No	Yes	No	Yes
No. of obs.	964	964	657	657	307	307
R^2	0.005	0.094	0.010	0.125	0.000	0.140
Outcome mean	0.118	0.118	0.125	0.125	0.104	0.104

change the magnitude of the coefficients noticeably, reinforcing the premise of random variation in the VCs across panels (columns 2, 4, and 6).

It is useful to benchmark the 17% effect among men against other related findings regarding frictions in entrepreneurial finance. Bernstein, Giroud, and Townsend (2016) find that reducing travel time between a VC firm and its portfolio company by 126 min increases the portfolio company patent citations by 5.8%–7.4%. Bernstein, Korteweg, and Laws (2017) find that revealing a small amount of information about a startup team to angel investors increases their probability that the investor demonstrates interest in the company by 13%. Ewens and Townsend (2020) show that female-led companies are 42% less likely to be shared by male investors. Our result joins others in documenting economically large frictions in early stage startup investing.

To probe these results further and to address other potential sources of unobserved heterogeneity, we move in Table 5 to estimating the impact of an additional

TABLE 5

Effect of Number of VC Judges on VC-Backed Entrepreneurship by Gender

Table 5 shows the effect of the number of venture capitalists (VCs) on the probability that female participants in the HBS NVC subsequently found VC-backed ventures, relative to male participants. "VCs_ON_PANEL" is the continuous number of VC judges on the panel. "Female" is an indicator for the participant being female. In Panel B, the sample is restricted to participants in the 10–90th percentiles of score, which is the average of individual judge scores and is unobserved to both participants and judges. Female-by-sector fixed effects absorb the independent effect of female. Person controls consist of these indicator variables: Interest in entrepreneurship, interest in finance, interest in management, entrepreneurship or VC clubs membership at HBS, previous VC-backed entrepreneurship experience, previous work for a VC-backed startup, previous work for a VC firm, previous non-VC-backed entrepreneurship, honors at HBS, U.S. citizen, computer science college major, engineering college major, economics/business/management college major, and college degree from an Ivy+ university. Competition controls consist of these variables: The venture score in the panel, indicator for winning the competition (overall or runner-up), the number of ventures on the panel, the number of male judges on the panel, and the total number of judges on the panel. There are six sectors: IT/Software/Web, Consumer Goods, Media/Education, Tough Tech (Tangible High-Tech), Financial/Real Estate, and Health. Standard errors are clustered by judging group (the "panel" of ventures who pitch to a certain set of judges). *, **, and *** indicate significance at the 10%, 5%, and 1% levels, respectively.

	Dependent Variable: VC-Backed Entrepreneurship After HBS			
Panel A. Whole Sample				
	1	2	3	4
VCs_ON_PANEL × FEMALE	−0.026*	−0.029**	−0.032**	−0.045**
	(0.013)	(0.014)	(0.014)	(0.020)
VCs_ON_PANEL	0.021*	0.021*	0.023**	
	(0.011)	(0.011)	(0.011)	
Female × sector FE	Yes	Yes	Yes	Yes
Competition controls	No	Yes	Yes	Yes
Person controls	No	No	Yes	Yes
Panel FE	No	No	No	Yes
No. of obs.	964	964	964	964
R^2	0.062	0.081	0.101	0.255
Outcome mean	0.118	0.118	0.118	0.118
Panel B. Participants in 10–90th Score Percentiles				
VCs_ON_PANEL × FEMALE	−0.026*	−0.028*	−0.033**	−0.051***
	(0.014)	(0.015)	(0.014)	(0.018)
VCs_ON_PANEL	0.020	0.020	0.022*	
	(0.012)	(0.013)	(0.012)	
Female × sector FE	Yes	Yes	Yes	Yes
Competition controls	No	Yes	Yes	Yes
Person controls	No	No	Yes	Yes
Panel FE	No	No	No	Yes
No. of obs.	777	777	777	777
R^2	0.066	0.074	0.103	0.311
Outcome mean	0.118	0.118	0.118	0.118

VC on post-NVC VC-backed entrepreneurship for female relative to male partic-
ipants. We use the following estimating equation:

$$(1) \qquad \text{VC\_ENTREPRENEUR}_i = \alpha_t + \text{FEMALE}_\mathbf{i}\text{SECTOR}_\mathbf{v}'\mu$$
$$+ \beta_1 \text{FEMALE}_i \# \text{VCs\_PANEL}_j$$
$$+ \beta_2 \# \text{VCs\_PANEL}_j + \mathbf{X}_{i,v}'\delta + \mathbf{X}_j'\gamma + \varepsilon_{ijt}.$$

Here, i denotes a participant, j a panel, and v a venture. The primary outcome
of interest is an indicator for the participant becoming a VC-backed entrepreneur
after HBS. The coefficient β_1 measures the differential impact of an additional VC
for women relative to men. Note that since the variable FEMALE_i is an indicator,
the coefficient β_2 measures the impact that an additional VC has on post-HBS
VC-backed entrepreneurship among men.

In addition to individual-, venture-, and panel-level covariates ($\mathbf{X}_{i,v}'\delta$ and $\mathbf{X}_j'\gamma$),
our regressions include female-by-sector fixed effects ($\text{FEMALE}_\mathbf{i}\text{SECTOR}_\mathbf{v}'\mu$),
which address the potential concern that the baseline propensity for entrepreneur-
ship may vary systematically by industry sector in a manner that might be system-
atically correlated with gender. We also include fixed effects for the year of the NVC
(α_t). In alternative specifications, we use female-by-year and panel fixed effects,
the latter of which absorb the number of VCs.[11] We cluster standard errors at the
panel level, though the results are robust to clustering at the venture level. We also
show the results are robust to venture-level analysis, comparing all-female, mixed,
and all-male teams.

This empirical strategy enables us to formally test the benefit of an additional
VC for male relative to female participants. The first column in Panel A of Table 5
includes only female-by-sector fixed effects as controls. The coefficient on the
interaction indicates that an additional VC on a panel reduces the chances of
women launching a VC-backed startup by 2.6 percentage points relative to men.
Column 2 adds controls related to the competition, such as the venture score,
which is unobserved to participants and addresses concerns about unobserved
quality of the pitches. Recall that the scores contain useful information, as Howell
(2020) finds in a larger sample of competitions. On average scores are strongly
correlated with VC-backed entrepreneurship (columns 1 and 2 of Table A.3 in the
Supplementary Material). In column 3 of Table 5, we add individual covariates
such as college major and interest in entrepreneurship, which may be correlated
with the decision to become an entrepreneur. The effects are quite stable across
these specifications. In column 4, we further include panel fixed effects, which
absorb the number of VCs on the panel, and find that the effect increases some-
what but continues to be extremely robust.

Panel B of Table 5 repeats these models but explores the possibility that
there may be differential selection by gender into the NVC. While selection into
the NVC does not impact the internal validity of the analysis, it does have a bearing
on our ability to generalize the results. For example, Table A.3 in the Supplementary
Material shows that women have slightly higher scores on average. One might be

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[11]There are six sectors: IT/Software/Web, Consumer Goods, Media/Education, Tough Tech
(Tangible High-Tech), Financial/Real Estate, and Health.

concerned that women's ventures are "so good" that they do not need to network with NVC judges. We therefore restrict the sample to the participants who were between the 10th and the 90th percentile of the score distribution (recall that overall scores are unobserved to participants and judges). This forms a sample of relatively marginal candidates, whose outcomes might be more sensitive to networking opportunities. The coefficients in Panel B are extremely similar to the main effects in Panel A. These results are consistent with our proposed identification and demonstrate that especially high- or low-quality ventures do not explain the results.

We are also interested in whether the highest quality ventures drive the results. In Table A.4 in the Supplementary Material, we restrict the sample to the top tercile of scores (Panel A) and the bottom tercile of scores (Panel B). The results are statistically similar for ventures with quality in the top and bottom thirds, though the results are slightly larger and more precise for the bottom third. This, together with the result from Panel B of Table 5, indicates that the effect is relatively independent of score and is not concentrated among the very best ventures in the competition. Instead, the opportunity to network afforded by the competition appears useful across the distribution but is most useful among lower-quality ventures, suggesting that this group is relatively more constrained when it comes to network access. However, it is possible that in the real world the phenomenon could be equally strong for high-quality ventures, but is more difficult to detect using our empirical approach, which captures only marginal effects in a local average treatment effects (LATEs).

We next examine which type of VC investor appears to drive the result. First, in columns 1 and 2 of Table 6, we show that controlling for whether the judge himself invested in the venture does not affect our results. While the coefficient on judge investing is strongly positive, it does not attenuate the main finding. This suggests that the main effect is driven by referral networks among investors. Our setting is not well suited to assess whether the judges in their role as investors are biased against women, because so few of the judges invested in the ventures they judged. This is to be expected since the ventures are at a pre-seed stage, while the judges tend to invest in later rounds.

Subsequent columns of Table 6 show that the results are largely driven by early-stage VCs. For this analysis, we manually researched whether the VCs' firms primarily do early, late, or unspecialized (i.e., "generalist") investing. Where available, we relied on Crunchbase's categorization. Otherwise, we used Pitchbook deal types and firm websites. We were able to assign a stage to 126 unique VC firms. Of these, 40 are early specialists, typically focusing on Series A rounds (not the seed or angel deals that are more typically a startup's first outside financing). Of the remainder, 22 are late specialists, and 64 do not specialize. We interact being female with the number of VCs of a particular stage. The coefficient for early stage VCs is 0.056, larger than our main estimate (column 3). The other two coefficients are insignificant, but the one for late is 0.01, whereas the one for generalists is -0.024, suggesting possible monotonicity in early stage deal making. The means for early, late, and generalist are 0.48, 0.26, and 1.03, respectively. While our results are not driven by the VCs themselves investing in the very early stage participating ventures, it is not surprising that the VCs with the most relevant networks are those who specialize in early stage deals.

TABLE 6

Effect of Number of VC Judges on VC-Backed Entrepreneurship by
Gender and Judge Characteristics

Column 1 of Table 6 shows the effect of the number of male and female VCs on the probability that a male participant in the HBS NVC subsequently founds a VC-backed venture, relative to female participants. Columns 1 controls for the judge investing in the venture (there are only four instances of this). Columns 2–5 assess whether the main effect differs by the stage of investing in which the VC specializes: early deals (Series A–B), late deals (subsequent series), or generalist (unspecialized in a particular stage). In each case, we redefine the number of VCs on the panel to include only the number of VCs within a certain category of specialization. Person controls consist of these indicator variables: Interest in entrepreneurship, interest in finance, interest in management, entrepreneurship or VC clubs membership at HBS, previous VC-backed entrepreneurship experience, previous work for a VC-backed startup, previous work for a VC firm, previous non-VC-backed entrepreneurship, honors at HBS, U.S. citizen, computer science college major, engineering college major, economics/business/management college major, and college degree from an Ivy+ university. Competition controls consist of these variables: The venture score in the panel, indicator for winning the competition (overall or runner-up), the number of ventures on the panel, the number of male judges on the panel, and the total number of judges on the panel. There are six sectors: IT/Software/Web, Consumer Goods, Media/Education, Tough Tech (Tangible High-Tech), Financial/Real Estate, and Health. Standard errors are clustered by judging group (the "panel" of ventures who pitch to a certain set of judges). *, **, and *** indicate significance at the 10%, 5%, and 1% levels, respectively.

	Dependent Variable: VC-Backed Entrepreneurship After HBS				
	1	2	3	4	5
VCs_ON_PANEL × FEMALE	−0.027**	−0.033**			
	(0.013)	(0.014)			
VCs_ON_PANEL	0.022**	0.023**			
	(0.011)	(0.011)			
JUDGE_INVESTED	0.867***	0.791***			
	(0.083)	(0.059)			
EARLY_VCs_ON_PANEL × FEMALE			−0.056*		
			(0.033)		
EARLY_VCs_ON_PANEL			0.018		
			(0.022)		
LATE_VCs_ON_PANEL × FEMALE				0.010	
				(0.042)	
LATE_VCs_ON_PANEL				−0.032	
				(0.025)	
GENERALIST_VCs_ON_PANEL × FEMALE					−0.024
					(0.022)
GENERALIST_VCs_ON_PANEL					0.013
					(0.013)
Year FE	Yes	Yes	Yes	Yes	Yes
Female × sector FE	Yes	Yes	Yes	Yes	Yes
Competition controls	No	Yes	Yes	Yes	Yes
Person controls	No	Yes	Yes	Yes	Yes
No. of obs.	964	964	964	964	964
R^2	0.077	0.113	0.096	0.096	0.096
Outcome mean	0.118	0.118	0.118	0.118	0.118

We explore whether the number of VCs on the panel leads to different startup outcomes by gender conditional on the startup receiving VC funding in Table A.5 in the Supplementary Material. A caveat to this analysis is that since we are conditioning on those who started VC-backed ventures, the sample is quite small. Columns 1 and 2 consider the amount of VC financing within 2 years of the competition. In column 2, we use an indicator for financing above the 90th percentile. The sign of the coefficient suggests that an additional VC increases the chances of very high funding for men relative to women, but the small sample size means that the coefficient is imprecisely estimated. Columns 3 and 4 find no significant effects on real outcomes in the forms of acquisition or employment. These results, while imprecisely measured, suggest that the networking friction we observe acts on the extensive margin of becoming a VC-backed entrepreneur.

Conditional on raising VC, women appear to have established the necessary networks to succeed.

In sum, the results indicate that exposure to VCs in particular is more useful to nascent male entrepreneurs than to their female counterparts. Beyond VC judges' expertise in evaluating startups, networking value is no doubt one reason why NVCs (including HBS) try to include as many of them in their judge pool as possible. We demonstrate that this networking value accrues disproportionately to male founders.

We believe that this finding can generalize to the broader population beyond HBS and may even be more salient in other contexts. The highly motivated, relatively well-networked students in our sample likely face fewer of these frictions than individuals in the broader population. The fact that male participants benefit from random exposure to VCs suggests that networking frictions are likely to be important in other settings too. Moreover, the gender-based networking frictions we identify are likely present in high-growth entrepreneurship more generally. That said, the selected sample of HBS NVC participants is a potential limitation of our study.

B.   Robustness Tests

Our first and most important robustness exercise consist of placebo tests, which offer compelling evidence that our effect is not spurious. In columns 1–3 of Table 7, we examine alternative outcome variables: non-VC-backed entrepreneurship, employment at a VC-backed company, and non-investor venture funding, defined as grants, incubators, accelerators, business plan competitions, and crowdfunding. In all three cases, there is no effect of the interaction between being female and the number of VCs on the panel.

In the remainder of the Table 7, we ask whether other types of judges affect VC-backed entrepreneurship. All of the judges are highly successful individuals with some connection to entrepreneurship (e.g., lawyers for startups, and executives running corporate venture programs), so it is possible that our effect reflects useful connections based on other characteristics that may be correlated with being a VC. In column 4, we interact female with the number of male judges on the panel in case gender homophily is the source of our effect. While the coefficient is negative, it is smaller and statistically insignificant. In column 5, we consider the number of judges in the participant's sector and find a small and insignificant coefficient. In columns 6 and 7, we consider the number of entrepreneur and corporate executive judges, and find small, insignificant effects.

We also demonstrate that the results are robust to analysis at the venture level. Table 8 shows the effect of the number of VCs on the probability that a venture with female team members in the HBS NVC subsequently raises VC, relative to ventures with male team members. Analysis is at the venture level, using a categorical variable that takes one of three values for whether the team is: all female, mixed, or male. All male is omitted. In column 1, we consider all team types. The results indicate that the effect is clearly driven by all female and mixed teams, though the coefficient on mixed teams is insignificant. In column 2, we omit mixed teams and find a similar result. Note that as in the main model, fixed effects for team type by sector absorb the independent effect of team type.

TABLE 7

Placebo Tests

Table 7 shows tests for whether VC judges interacted with participant gender predict outcomes besides VC-backed entrepreneurship, and whether non-VC judges interacted with gender predict VC-backed entrepreneurship. In all cases, we include the independent effect of the number of judges (e.g., number of VCs on the panel or number of entrepreneur judges on the panel) but do not report it to keep the table parsimonious. Column 1 shows the effect of the number of VCs on the probability that the participant founds a firm that does not receive VC backing. Column 2 shows the effect on working as an employee at a company that is VC-backed. Column 3 considers early funding for the participant's startup from accelerators, grants, incubators, crowdfunding, and competitions. Columns 4–7 repeat the main regression in column 3 of Table 5, but use the number of judges in categories besides VC. Corp. Exec. is an abbreviation of Corporate Executive. Person controls consist of these indicator variables: Interest in entrepreneurship, interest in finance, interest in management, entrepreneurship or VC clubs membership at HBS, previous VC-backed entrepreneurship experience, previous work for a VC-backed startup, previous work for a VC firm, previous non-VC-backed entrepreneurship, honors at HBS, U.S. citizen, computer science college major, engineering college major, economics/business/management college major, and college degree from an Ivy+ university. Competition controls consist of these variables: The venture score in the panel, indicator for winning the competition (overall or runner-up), the number of ventures on the panel, the number of male judges on the panel, and the total number of judges on the panel. There are six sectors: IT/Software/Web, Consumer Goods, Media/Education, Tough Tech (Tangible High-Tech), Financial/Real Estate, and Health. Standard errors are clustered by judging group (the "panel" of ventures who pitch to a certain set of judges). *, **, and *** indicate significance at the 10%, 5%, and 1% levels, respectively.

	Dependent Variable						
	Non-VC-Backed Entrep.	VC-Backed Comp. Empl.	Non-Investor Funding	VC-Backed Entrepreneurship			
	1	2	3	4	5	6	7
VCs_ON_PANEL × FEMALE	−0.007 (0.016)	0.001 (0.022)	0.000 (0.008)				
VCs_ON_PANEL	−0.016 (0.011)	0.021 (0.013)	0.006 (0.005)				
MALE_JUDGES_ ON PANEL × FEMALE				−0.015 (0.014)			
MALE_JUDGES_ON_PANEL				−0.014 (0.015)			
SECTOR_JUDGES_ ON_PANEL × FEMALE					−0.012 (0.013)		
SECTOR_JUDGES_ON_PANEL					−0.002 (0.009)		
ENTREP_JUDGES_ ON_PANEL × FEMALE						0.013 (0.023)	
ENTREP_JUDGES_ON_PANEL						−0.021 (0.015)	
CORPEXEC_JUDGES_ ON_PANEL × FEMALE							0.011 (0.024)
CORPEXEC_JUDGES_ ON_PANEL							0.008 (0.014)
Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Female × sector FE	Yes	Yes	Yes	Yes	No	Yes	Yes
Competition controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Person controls	Yes	Yes	Yes	No	Yes	Yes	Yes
No. of obs.	964	964	964	964	964	964	964
R^2	0.061	0.138	0.106	0.079	0.086	0.098	0.098
Outcome mean	0.195	0.482	0.033	0.118	0.118	0.118	0.118

There may be concern that the baseline propensity for entrepreneurship varies systematically over time, and this is somehow correlated with VC judges on the panels. In Table A.6 in the Supplementary Material, we replace the female-by-sector fixed effects from Table 5 with female-by-year fixed effects. The results are quite similar to the main effects, indicating that gender-specific time trends do not explain our findings.

A related concern is that our main finding reflects some characteristic correlated with gender. In Table A.7 in the Supplementary Material, we interact #VCs_PANEL$_j$ with a wide array of relevant previous job experiences: previous

TABLE 8

Effect at Venture Level

Table 8 shows the effect of the number of venture capitalists (VCs) on the probability that a venture with female team members in the HBS NVC subsequently raises VC, relative to ventures with male team members. Analysis is at the venture level, using a categorical variable that takes one of three values for whether the team is: all female, mixed, or male. All male is omitted. "VCs_ON_PANEL" is the continuous number of VC judges on the panel. Fixed effects for team type by sector absorb the independent effect of team type. Competition controls consist of these variables: The venture score in the panel, indicator for winning the competition (overall or runner-up), the number of ventures on the panel, the number of male judges on the panel, and the total number of judges on the panel. There are six sectors: IT/Software/Web, Consumer Goods, Media/Education, Tough Tech (Tangible High-Tech), Financial/Real Estate, and Health. Standard errors are clustered by judging group (the "panel" of ventures who pitch to a certain set of judges). *, **, and *** indicate significance at the 10%, 5%, and 1% levels, respectively.

	Dependent Variable: VC-Backing After HBS (Venture-Level)	
	Full Sample	No Mixed Gender Teams
	1	2
VCs_ON_PANEL × FEMALE_TEAM	−0.029**	−0.033**
	(0.014)	(0.014)
VCs_ON_PANEL × MIXED_TEAM	−0.028	
	(0.018)	
VCs_ON_PANEL	0.008	0.011
	(0.007)	(0.008)
Team cat × sector FE	Yes	Yes
Competition controls	No	Yes
No. of obs.	647	569
R^2	0.053	0.118
Outcome mean	0.118	0.118

VC-backed entrepreneurship (column 1), previous non-VC-backed entrepreneurship (column 2), previous employment at a VC-backed company (column 3), previous employment at a VC firm (column 4), previous employment in management consulting (column 5), and previous employment in financial services (column 6). In no case, do we observe an effect of the interaction between the job experience and the number of VCs on the panel. In Table A.8 in the Supplementary Material, we consider six additional binary participant characteristics: undergraduate degree from an Ivy+ college (column 1), HBS honors (column 2), computer science major (column 3), engineering major (column 4), econ/business major (column 5), and winning the NVC round (column 6). We again find no effects, with one exception. The interaction is significant for participants whose college major was economics/business. This major is uncorrelated with gender.

Last, in Table A.9 in the Supplementary Material, we split the sample by time period and number of ventures on the panel to test whether a part of our sample is responsible for the effect (though note we control for these factors in the main model). The results suggest a somewhat stronger effect in the later period, though the two coefficients are not significantly different. However, to the extent, this difference may be substantive, it could indicate a higher value of networking resources in early stage entrepreneurship in more recent years, when the rise in entrepreneurial activity perhaps made it harder to screen ventures.

V.   Potential Mechanisms

Our results provide robust evidence of networking frictions in VC. For male entrepreneurs, random exposure to additional VC investors on the NVC judging

panels increases the likelihood of the participant engaging in VC-backed entrepreneurship after graduation. However, we do not find any such impact for women, implying that exposure to VCs is more useful for nascent male entrepreneurs than for their female counterparts.

While our data do not allow us to rule out specific channels that might be driving this differential impact on male and female participants, we provide two sets of analyses to examine some of the dynamics behind the pattern in greater detail.

A.   Judge Gender

Our first analysis examines the degree to which judge gender plays a role in the results we see. Specifically, we separately examine the impact that male and female VC judges have on male and female participants. Table 9 repeats the models of Table 4 using the number of male or female VC judges on the panel. Note that while most VC judges are men, there is enough variation in female VC judges across panels to observe an effect if one exists. At the panel level, there are on average 0.5 female VC judges with a standard deviation of 0.67. Panels have between zero and three female VC judges. The results in columns 1 and 3 clearly indicate that our effect is driven by male VCs matching with male participants, whereas female VCs have no effect on either male or female participants (columns 2, 5, and 6). This result is consistent with gender-based homophily in networking. We expect this dynamic if male participants are more comfortable than female participants with reaching out

TABLE 9

Effect of Number of Male and Female VC Judges on VC-Backed Entrepreneurship by Gender

Table 9 shows the effect of the number of venture capitalists (VCs) on the probability that female participants in the HBS NVC subsequently found VC-backed ventures, relative to male participants. "MALE_VCs_ON_PANEL" and "FEMALE_VCs_ON_PANEL" are the continuous number of male and female VC judges on the panel, respectively. "Female" is an indicator for the participant being female. Fixed effects for female by sector absorb the independent effect of female. Person controls consist of these indicator variables: Interest in entrepreneurship, interest in finance, interest in management, entrepreneurship or VC clubs membership at HBS, previous VC-backed entrepreneurship experience, previous work for a VC-backed startup, previous work for a VC firm, previous non-VC-backed entrepreneurship, honors at HBS, U.S. citizen, computer science college major, engineering college major, economics/business/management college major, and college degree from an Ivy+ university. Competition controls consist of these variables: The venture score in the panel, indicator for winning the competition (overall or runner-up), the number of ventures on the panel, the number of male judges on the panel, and the total number of judges on the panel. Standard errors are clustered by judging group (the "panel" of ventures who pitch to a certain set of judges). *, **, and *** indicate significance at the 10%, 5%, and 1% levels, respectively.

	Dependent Variable: VC-Backed Entrepreneurship After HBS					
	Men Only			Women Only		
	1	2	3	4	5	6
MALE_VCs_ON_PANEL	0.028** (0.013)		0.028** (0.013)	−0.007 (0.016)		−0.008 (0.016)
FEMALE_VCs_ON_PANEL		−0.000 (0.020)	0.007 (0.020)		−0.036 (0.025)	−0.037 (0.025)
Year FE	Yes	Yes	Yes	Yes	Yes	Yes
Sector FE	Yes	Yes	Yes	Yes	Yes	Yes
Competition controls	Yes	Yes	Yes	Yes	Yes	Yes
Person controls	Yes	Yes	Yes	Yes	Yes	Yes
No. of obs.	657	657	657	307	307	307
R^2	0.126	0.116	0.126	0.137	0.141	0.142
Outcome mean	0.125	0.125	0.125	0.125	0.125	0.125

TABLE 10

Effect of Number of Male and Female VC Judges on VC-Backed
Entrepreneurship with Gender Interaction

Table 10 shows the effect of the number of venture capitalists (VCs) on the probability that female participants in the HBS NVC subsequently found VC-backed ventures, relative to male participants. "MALE_VCs_ON_PANEL" and "FEMALE_VCs_ON_ PANEL" are the continuous number of male and female VC judges on the panel, respectively. "Female" is an indicator for the participant being female. Fixed effects for female by sector absorb the independent effect of female. Person controls consist of these indicator variables: Interest in entrepreneurship, interest in finance, interest in management, entrepreneurship or VC clubs membership at HBS, previous VC-backed entrepreneurship experience, previous work for a VC-backed startup, previous work for a VC firm, previous non-VC-backed entrepreneurship, honors at HBS, U.S. citizen, computer science college major, engineering college major, economics/business/management college major, and college degree from an Ivy+ university. Competition controls consist of these variables: The venture score in the panel, indicator for winning the competition (overall or runner-up), the number of ventures on the panel, the number of male judges on the panel, and the total number of judges on the panel. Standard errors are clustered by judging group (the "panel" of ventures who pitch to a certain set of judges). *, **, and *** indicate significance at the 10%, 5%, and 1% levels, respectively.

	Dependent Variable: VC-Backed Entrepreneurship After HBS			
	1	2	3	4
MALE_VCs_ON_PANEL × FEMALE	−0.028* (0.016)		−0.028* (0.016)	−0.048** (0.023)
MALE_VCs_ON_PANEL	0.026** (0.012)		0.027** (0.012)	
FEMALE_VCs_ON_PANEL × FEMALE		−0.046 (0.035)	−0.050 (0.034)	−0.035 (0.051)
FEMALE_VCs_ON_PANEL		0.002 (0.020)	0.009 (0.020)	
Female × sector FE	Yes	Yes	Yes	Yes
Competition controls	Yes	Yes	Yes	Yes
Person controls	Yes	Yes	Yes	Yes
Panel FE	No	No	No	Yes
No. of obs.	964	964	964	964
R^2	0.102	0.096	0.104	0.255
Outcome mean	0.118	0.118	0.118	0.118

and networking with male VCs, or if male VCs are more likely to make useful referrals to other investors in their network for male entrepreneurs.

We confirm this result in the interaction model. Column 1 of Table 10 shows that the coefficient on male VCs is slightly larger than the equivalent model in Table 5, suggesting that male participants benefit more from an additional male VC on the panel than the average VC judge. The negative and significant interaction on female participants and male VCs again documents our main finding, that an additional male VC has no measurable impact on female participants' VC-backed entrepreneurship post HBS.

However, this pattern is not symmetric, as shown in column 2 of Table 10. While male participants do not benefit from an additional female investor on the panel as might be expected with gender-based homophily, neither do female participants. In fact, although this is not statistically significant, the point estimates suggest that male entrepreneurs still benefit more from an additional female VC investor on their panel more than female participants do. This "null result" for female participants, even when randomly exposed to female VCs, is surprising and suggests the presence of one or both of the following two elements. First, female participants may not proactively reach out and network as much as male participants (e.g., if they hold themselves to a higher standard when choosing to reach out to VCs). If so, men may exploit networking opportunities much more than women. Second, the value of networking with a female VC may be diminished for both

women and men if there is gender-based homophily in networking within the VC community. In other words, if referrals tend to be mediated by gender-based homophily, the fact that 90% of investors are men implies that referrals from male investors may on average lead to more meetings with investors. Consistent with this notion, Cullen and Perez-Truglia (2023) find evidence that male employees assigned to male managers were promoted faster in the following years than male employees assigned to female managers while female employees had the same career progression regardless of their managers' gender. While we are unable to directly verify the existence of the second channel, we can use survey evidence to examine the potential presence of the first channel.

B.   Survey Results

The first step in examining the survey evidence is to test for response bias in the variables of interest. Columns 1 and 2 of Table 11 show that women were no more likely than men to respond to the survey. Further, there is no association

TABLE 11

Survey Response Predictors and Analysis

Table 11 shows results from the survey of NVC participants in our sample. Columns 1–2 of this table show predictors of responding to the survey (172/964 responded). Columns 3–5 examine whether reaching out to a judge varies by gender, conditional on responding. Column 6 examines whether judges are less likely to reach out to women. Column 7 examines whether, conditional on the participant reaching out to a VC judge, the judge is less likely to respond if the participant is female. Column 8 interacts being female with reaching out to a VC judge, with the outcome of VC-backed entrepreneurship after HBS. Person controls consist of these indicator variables: Interest in entrepreneurship, interest in finance, interest in management, entrepreneurship or VC clubs membership at HBS, previous VC-backed entrepreneurship experience, previous work for a VC-backed startup, previous work for a VC firm, previous non-VC-backed entrepreneurship, honors at HBS, U.S. citizen, computer science college major, engineering college major, economics/business/management college major, and college degree from an Ivy+ university. Competition controls consist of these variables: The venture score in the panel, indicator for winning the competition (overall or runner-up), the number of ventures on the panel, the number of male judges on the panel, and the total number of judges on the panel. There are six sectors: IT/Software/Web, Consumer Goods, Media/Education, Tough Tech (Tangible High-Tech), Financial/Real Estate, and Health. Standard errors are clustered by judging group (the "panel" of ventures who pitch to a certain set of judges). *, **, and *** indicate significance at the 10%, 5%, and 1% levels, respectively.

Sample:	All		Survey Respondents Contacted Judge					
Dependent Variable:	Responded to Survey		Contacted VC Judge			VC Judge Contacted Me	VC Judge Responded	VC Backing After HBS
	1	2	3	4	5	6	7	8
FEMALE	−0.019	−0.003	−0.177***	−0.163**	−0.219***	−0.028	0.000	−0.045
	(0.027)	(0.027)	(0.063)	(0.066)	(0.074)	(0.058)	(0.162)	(0.068)
VCs_ON_PANEL		−0.004			−0.038			
		(0.009)			(0.027)			
VC-BACKED_ENTREP.		0.047			0.068			
		(0.040)			(0.105)			
CONTACTED_VC_JUDGE								0.102
								(0.075)
FEMALE × CONTACTED_ VC_JUDGE								−0.035
								(0.155)
Year FE	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes
Sector FE	No	No	No	Yes	Yes	No	No	No
Competition controls	No	Yes	No	No	Yes	No	No	No
Person controls	No	Yes	No	No	Yes	No	No	No
No. of obs.	964	964	172	172	172	172	45	172
R^2	0.032	0.068	0.034	0.154	0.336	0.044	0.615	0.108
Outcome mean	0.178	0.178	0.262	0.262	0.262	0.163	0.867	0.140

between responsiveness and either the number of VCs on the panel or VC-backed entrepreneurship (column 2).

We then turn to analyzing the results within the sample of respondents. Women were much less likely to report having reached out to a VC judge after the competition. Columns 3–5 of Table 11 show that women were 16.3–21.9 percentage points less likely to reach out. Among survey respondents, 26% reached out. Therefore, our preferred specification in column 5 implies that women were 84% less likely than men to reach out to VCs. However, women were not significantly less likely than men to report a VC judge independently reaching out to them after the competition (column 6). Conditional on reaching out to a judge, male and female participants report the judge responding in equal numbers (column 7). Finally, in column 8, we use VC-backed entrepreneurship after HBS as the outcome, and interact being female with reaching out to a VC judge. The interaction coefficient is smaller than the other two and is also insignificant, consistent with a lack of reaching out being the primary mechanism for our results rather than women benefiting less from referral networks. However, note that not only is the sample here very small, but in almost all cases the judge *did* respond, making it difficult to assess whether there was selection on quality in which participants reached out to VCs.

The survey results offer suggestive evidence that our main findings reflect women being less likely to initiate networking with VCs. This is corroborated by the responses to the final open-ended question in the survey about the importance or ease of networking at the NVC. The responses contrast strikingly across men and women. Men emphasized the importance of networking and how they used the NVC to gain access to VCs, while women did not. Among 57 responses, 63% of men wrote that networking was important at the NVC, or described reaching out to VCs after NVC. Only 12.5% of women did, and the difference between these means is significant at the 0.01 level.

The following responses underline these differences. Male respondents noted that

> "The NVC was hugely valuable in helping us generate awareness of our venture (we were on CNN!) and in attracting investors (we closed $10.4M Series A with Sequoia, Marc Andreessen, and other great investors within weeks after the NVC event)."

> "Networking with angel and early-stage startup investors can add tremendous value to startups at the NVC - not only does it provide access to potential early-stage capital but it also provides access to investors who can bring critical thinking with regards to business plan / viability."

> "A connection to a panel judge reached out to us. He was an angel investor."

> "Networking is the name of the game!"

> "NVC was highly important to know and connect with investors in start-ups."

In contrast, the following responses are representative of the reports from women:

"I didn't think it was appropriate at the time/or was perhaps a bit shy to reach out. In general, I think encouraging future entrepreneurs to be very comfortable scheduling meetings/coffees/chats with the community would be hugely beneficial."

"I am not sure they had the background to understand our idea."

"It would be really helpful for a new venture that is participating and pitching in the competition to have more exposure to investors at that stage in the business. Participation in NVC did not feel like a platform to fundraise for us."

"I would have liked to receive some feedback as honestly participating in the contest felt like a waste of time. Thankfully, I keep doing the venture and despite the challenge it keeps going well."

Together, our results are consistent with women holding themselves to a higher standard when deciding whether or not to reach out to VCs. This phenomenon has been identified in other settings. For example, Chari and Goldsmith-Pinkham (2017) find that gender differences in submission rates of articles to the NBER's elite Summer Institute conference can explain the substantial gender gap among accepted authors. As a second example, Kolev et al. (2019) find the reason that women score lower in blinded grant application evaluations is because they tend to use more narrow words, despite having better scientific output conditional on funding.[12]

It is worth noting that our results could reflect excessive confidence among men. In this case, the fact that they are more aggressive in networking and this helps them to raise VC might not be socially optimal. Such a channel (along with the possibility that women reach out less because they hold themselves to a higher standard) only serves to reinforce the central point of this article, which is that networking is critical to how VC is allocated, and has the potential to shift allocation away from those with simply the best ideas and toward those individuals who both have access to, and can avail themselves of, networks to investors. In turn, this has implications for the direction of innovation and the pace of economic growth.

VI.   Conclusion

This article contributes to a small but growing literature looking more closely at frictions that might lead to systematic gaps in VC funding for new ventures, independent of the quality of ideas. We document the importance of one such friction: the fact that VCs rely on personal networks to source deal flow, which may lead them to systematically miss out on investment opportunities from less

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[12]Also see Lerchenmueller, Sorenson, and Jena (2019). Note that women are not universally less proactive in ways that are detrimental to their outcomes; Exley, Niederle, and Vesterlund (2020) isolate the decision to negotiate in a laboratory experiment and find that while women tend to negotiate less, this is not suboptimal as negotiating more leads to losses.

networked entrepreneurs. We expect that networking-related information frictions are likely to be particularly important in VC, given the large amount of asymmetric information and the high weight that VCs place on face-to-face connections and trusted referrals as deal sourcing methods. This reliance on networks may privilege those who are more connected or those who are most comfortable forming connections with investors.

Exploiting random variation in the number of VCs across judging panels at the HBS NVC, we find that additional VCs on a panel increase the likelihood of a male participant starting a VC-backed venture after graduation. Since our results are not due to these VCs directly investing in the startups on the panel, they imply indirect benefit through networks: in other words, among male participants of equivalent quality, those who were randomly given more access to VC investors were more likely to start VC-backed businesses after HBS. The magnitude of the effect is large, consistent with anecdotal evidence that potential entrepreneurs, even among highly networked HBS students, have trouble accessing the small number of VC investors.

Importantly, we also find that random exposure to additional VCs has no meaningful impact among female participants. That is, women assigned to panels with many VCs benefit less from this "lucky draw" than men who were assigned to these panels. Survey evidence points to this difference being driven by the fact that women are less likely to proactively reach out to VCs after the NVC.

There are numerous reasons why women might be less likely to proactively network than men. Men and women may have different beliefs about appropriate networking norms. There may also be homophily in networking, where individuals might feel more comfortable networking with others of the same gender. Since most VCs are men, this would lead to lower rates of networking with VCs among women. It is possible that women may not reach out if they anticipate discrimination. We cannot distinguish between these hypotheses. Nevertheless, the survey suggests that entrepreneurs rather than the VCs drive the networking discrepancy, consistent with evidence that women are less proactive or hold themselves to a higher standard than men.

Overall, this article documents that networking frictions are a source of differential access that might play an important role in the gender gap among VC-backed entrepreneurs, though of course there are many other non-mutually exclusive drivers of this gap. More generally, since the individuals behind ideas are intricately tied to the ideas themselves at a venture's earliest stages, and the distribution of good ideas is not perfectly correlated with networking to VCs, our results suggest that promising ideas may go unfunded because of systematic variations in VC access rather than because of the inherent quality of the idea. This is likely to be particularly salient when such access is mediated by the extent to which entrepreneurs proactively reach out to, and network with investors. The efficiency or welfare implications of these distortions to capital allocation are, however, beyond the scope of this article and a promising topic for future research. For example, the ability to proactively network can be seen as a skill that is an important input for the commercial success. On a practical note, however, our results suggest that encouraging female entrepreneurs to reach out may help, and future research studying which interventions most effectively reduce networking-related frictions will be extremely valuable.

Supplementary Material

To view supplementary material for this article, please visit http://doi.org/10.1017/S0022109023000819.

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